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Newsletter N.11 June 2025

RE-SAMPLE Last In-Person Consortium Meeting!

From 11 to 13 June 2025, the RE-SAMPLE Consortium met one last time in person in Vienna, hosted by HOPE - the European Hospital and Healthcare Federation - before their annual Agora event. This meeting was the occasion to discuss the final steps and quality checks of the project before its conclusion in August.

Keeping the same format as for the previous editions, the event was divided around different workshops that needed inputs from all partners - from the evaluation of the Virtual Companionship Programme to the models, and scientific coordination.

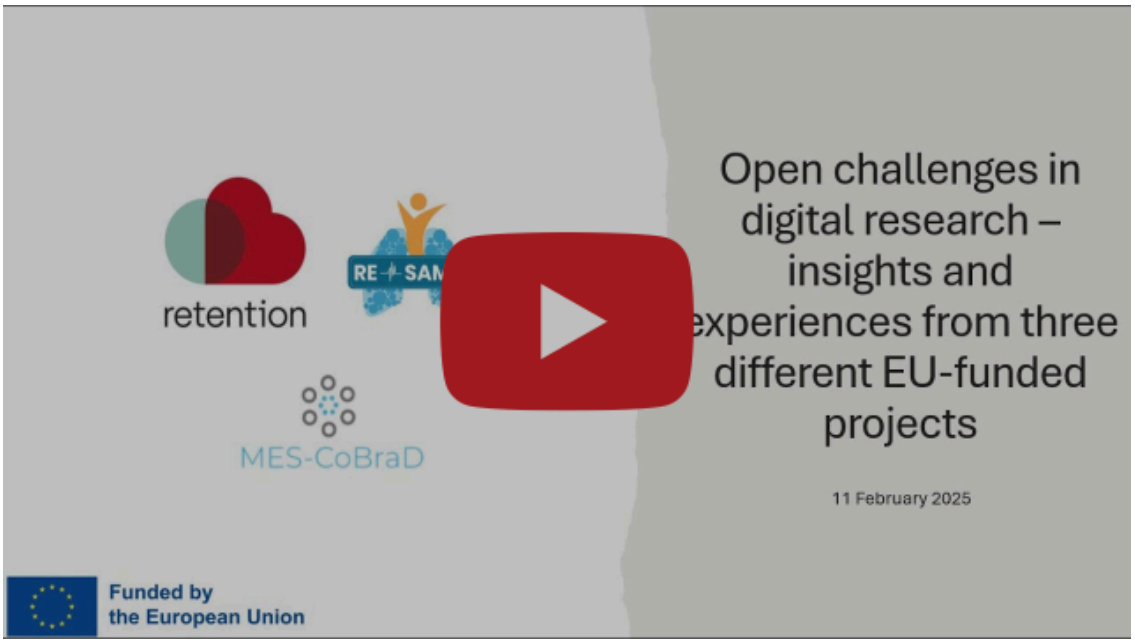
This meeting also provided an opportunity to discuss the post-project exploitation and dissemination, and to ensure that partners will stay in touch!

RE-SAMPLE Presentation at the HOPE Agora

On 13 June, Monique Tabak, the project coordinator, Serge Autexier, the technical coordinator, and Anke Lenferink, the clinical coordinator, presented the RE-SAMPLE project's results to the participants of the HOPE Exchange Programmes during the HOPE Agora event in Vienna!

Following Maria, one of our fictional patients, they presented the highlights and key results of the project.

Joint Webinar: Open challenges in digital research - insights and expereriences from three different EU-funded projects



On 11 February 2025, the RE-SAMPLE project organised a joint webinar with 2 sister projects, MES-CoBraD and RETENTION. The webinar was entitled "Open challenges in digital research – insights and experiences from three different EU-funded projects".

The session dealt with the ethical aspects of integrating AI into healthcare, digital literacy, and other big questions of today in digital and healthcare. The webinar showcased three presentations:

- RE-SAMPLE: Integrating a novel COPD and CCCs disease management solution into healthcare, by Serge Autexier (DFKI), Alice Luraschi (Fondazione Policlinico Universitario Agostino Gemelli IRCSS) and Agni Delvinioti (Fondazione Policlinico Universitario Agostino Gemelli IRCSS).
- RETENTION: Harnessing AI for Heart Failure: Enhancing Patient Care through Explainable and Ethical AI in the RETENTION Project. Mercedes Rivas Lasarte (SERMAS), Irina Nicolae (Siemens SRL) and Christina Nanou (Eunomia Ltd.)
- MES-CoBraD: At the intersection of medical ethics and AI ethics: the MES-CoBraD's ETHAI model. Francesca Morpurgo (CyberEthics Lab)

The presentations were followed by a guided discussion between the speakers, followed by questions from the audience.

RE-SAMPLE at ICHI 2025!

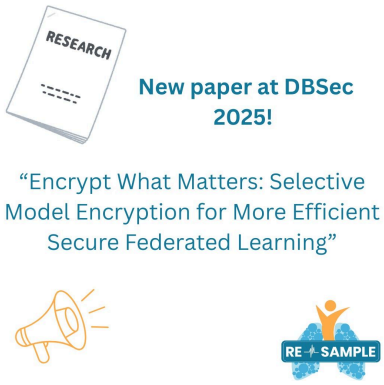
One of RE-SAMPLE results - "A Real-Time COPD Exacerbation Detection Algorithm Using multi-morbid symptom

diaries: Insights from a Multi-Site Study" - will be disseminated at the International Conference on Healthcare Informatics (ICHI 2025) taking place on 18 June 2025 in Rende, Italy.

It will be presented in the 2nd Workshop on Data Privacy and Data Analysis in Healthcare Systems.

In this paper we propose an algorithm, developed in the scope of the RE-SAMPLE project and based on the COPE-III protocol, for the real-time identification of COPD exacerbations. We additionally present our insights on its implementation and the results on the use in three hospitals across different countries in Europe.

Paper at DBSec 2025



From 23 to 25 June, the 39th edition of the Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec 2025) will take place in Gjovik, Norway.

Some of the RE-SAMPLE team members from the University of Twente had a paper accepted there entitled “Encrypt What Matters: Selective Model Encryption for More Efficient Secure Federated Learning”.

In this paper, the authors revisit the use of homomorphic encryption in federated learning and propose a selective model encryption strategy that significantly reduces the performance of overhead while preserving the same privacy level of existing solutions.

RE-SAMPLE in the highlights of the ERS 2024!

During the European Respiratory Society (ERS) Congress 2024, Gesa Wimberg from DFKI presented a RE-SAMPLE poster entitled “RE-SAMPLE platform for training and use of COPD exacerbation risk prediction models”.

In the article “ERS Congress 2024: highlights from the Allied Respiratory Assembly”, the RE-SAMPLE project is emphasized as exemplar of a multidimensional approach with a platform that enables data storage, synchronisation and management, monitoring, coaching, and risk profiling of COPD patients with comorbidities.

This platform can be used in the shared decision-making process between patients and healthcare professionals, and can help to identify disease progression early and develop tailored referral, care and support.

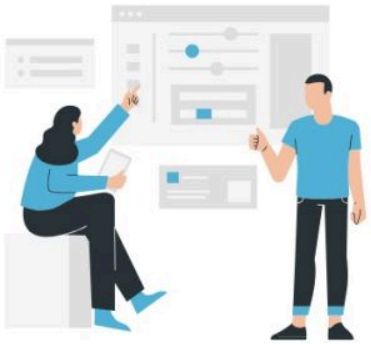
The RE-SAMPLE Platform: in continuous operation since August 2024

RE-SAMPLE Platform – In Continuous Operation

Since August 2024

The platform supports:

- Patient Data Storage & Retrieval
- Automated ML Model Training & Evaluation
- Generation of ML results
- Dashboard for Patient Monitoring



The RE-SAMPLE platform has been running continuously since August 2024, enabling machine learning development across the project partners hospitals.
The platform supports:

- Patient data storage and retrieval: includes components for storing and retrieving patient data required for training, predictions, and monitoring within each institution.
- Automated machine learning model training and evaluation: supports both local and federated training setups, helping partners develop and assess predictive models, while making sure that they are suited for their patient population.
- Generation of machine learning results: delivers on patient's risk factors for future COPD exacerbations and quality of life scores, along with interpretable explanations to support clinical understanding
- Dashboard for patient monitoring: allows clinicians to view data from questionnaires, activity trackers, and hospital visits – supporting a comprehensive understanding of each patient's status.

This setup enables the use of real-world data and machine learning in practical, privacy-aware way.

Publications

Self-management of COPD supported by eHealth: Patients' attitudes towards monitoring, risk prediction and virtual coaching

On 13 October 2024, Marian Hurmuz, Eline te Braake, Stephanie Jansen-Kosterink and Christiane Grünloh published a paper titled "Self-management of COPD supported by eHealth: Patients' attitudes towards monitoring, risk prediction and virtual coaching" in NordiCHI '24: Proceedings of the 13th Nordic Conference on Human-Computer Interaction.
Link to publication

The abstract can be read below:

Purpose

Chronic obstructive pulmonary disease (COPD) has a high burden on patients, tremendously affecting their quality of life. For patients to be more pro-active, self-management is important. To support patients in their self-management, health data collection is needed for monitoring, which can be used for risk predictions and personalised coaching. Within the RE-SAMPLE project, we want to include these features in an eHealth technology. This study aims to investigate the attitudes of people with COPD towards health monitoring, risk predictions and virtual coaching.

Methods

Ten persons participated in the interviews focusing on monitoring, risk prediction and virtual coaching.

Results

In general, participants were positive towards the concepts health monitoring, risk predictions and virtual coaching within a self-management eHealth technology. However, most participants felt that persons who are more recently diagnosed with COPD would benefit more from using such a technology. People who are dealing with COPD for several years already know or think they know how to self-manage their disease and what helps them and what not.

Conclusion

Based on our findings, we discuss several implications for design of self-management eHealth technologies for COPD: personalization in context and level of details, supporting people to reflect on their behaviour and patterns detected in the monitoring, balance accountability and paternalism when it comes to coaching, and finally explainable AI concerning risk predictions. Furthermore, we want to argue that in these types of studies, it is also important

We conducted workshops and interviews with persons diagnosed with COPD. Six persons participated in the workshops which focused on topics for virtual coaching.

to include people newly diagnosed with COPD to have more inclusive results.

RE-SAMPLE Platform for training and use of COPD exacerbation risk prediction models

On 30 October 2024, Alberto Acebes, Serge Autexier, Marjolein Brusse-Kesier and other members of the RE-SAMPLE projects published a paper titled "RE-SAMPLE Platform for training and use of COPD exacerbation risk prediction models" in the European Respiratory Journal.
Link to publication

This article was presented at the 2024 ERS Congress in the session "Innovative perspectives on cellular mechanisms in lung diseases".

The abstract can be read below:

Background
Many COPD patients experience multiple chronic conditions increasing their burden, healthcare consumption and costs. Due to the interplay of the diseases and overlapping symptoms, disease management is complex.

Methods
Three collaborating European hospitals provided retrospective clinical data enriching holistic data of a current

This allows for privacy preserving federated training of machine learning (ML) models. The combined models are available in all hospitals to provide personalised predictions and explanations displayed in the clinical dashboard of the Healthentia portal app.

Results
Edge nodes enable the use of clinician front ends for monitoring and shared decision-making. Cooperative training of models is functional. The analysis of predictive models trained on retrospective data shows that the number of COPD exacerbations in the previous year is the most important predictor for COPD exacerbation risk within following year (single feature model accuracy 75.6% on a balanced dataset, n=1068). This is in line with literature and is evidence for the suitability of the models.

Conclusion
The RE-SAMPLE platform enables data storage, synchronisation and management for patient monitoring and privacy-preserving training of federated ML models suitable for use in shared-

prospective cohort study. The RE-SAMPLE platform manages the clinical data and RWD collected by patients using the Healthentia App at edge nodes on-site in each hospital.

decision making in patients with COPD and comorbidities.

A Multiple Source Data Collection and Integration Paradigm for the Creation of a Dynamic COPD Data Mart

In 2025, Giulio Pagliari, Agni Delvinioti, Nicoletta Di Giorgi, Maria Vittoria De Girolamo, Angela Nervoso, Francesco Ma cagno, Carlotta Masciocchi, Stefano Patar nello and Alice Luraschi, published a paper entitled: "A Multiple Source Data Collection and Integration Paradigm for the Creation of a Dynamic COPD Data Mart" in the Proceedings of the 18th International Joint Conference on Biomedical Engineering Systems and Technologies.
Link to publication

The abstract can be read below:

The creation of dynamic data marts in a hospital environment is challenging due to the number of different data sources, the heterogeneity of data formats and the availability of structured datasets.

Other than identifying the relevant pathology and related information, the interaction with the Hospital Information System requires dedicated personnel and an in-depth knowledge of the IT architecture of the Hospital.

In this paper, we show an ad-hoc solution for the RE-SAMPLE project in Fondazione Policlinico Universitario Agostino Gemelli IRCCS, where the Chronic Obstructive Pulmonary Disease (COPD) is studied and a framework for managing that pathology is proposed.

The final aim of this work is to provide a description of the tailored procedures of data extraction, integration and harmonization, and the final creation of a dedicated COPD data mart for research purposes that has been implemented in the hospital premises by Gemelli Generator RWD R&D.

Federated Learning in Multi-Center, Personalized Healthcare for COPD and Comorbidities: The RE-SAMPLE Platform

In 2025, Jakob Lehmann, Gesa Wimberg, Serge Autexier, Alberto Acebes, Christos Kalloniatis, Costas Lamprinoudakis, Thrasyvoulos Giannakopoulos, Andreas Menegatos, Agni Delvinioti, Giulio Pagliari, Nicoletta di Giorgi, Jarno Raid, Danae Lekka, Aristodemos Pnevmatikakis, Sofoklis Kyriazakos, Konstantina Kostopoulou and Monique Tabak, published a paper entitled: "Federated Learning in Multi-Center, Personalized Healthcare for COPD and Comorbidities: The RE-SAMPLE Platform" in the Proceedings of the 18th International Joint Conference on Biomedical Engineering Systems and Technologies.

Link to publication

The abstract can be read below:

Federated learning is becoming more and more popular, also in healthcare applications.The platform, developed within a multidisciplinary consortium, is enabling privacy-preserving training of machine learning models generating predictions for patients with chronic obstructive pulmonary disease and comorbidities.

Moreover, data synchronization and monitoring is made possible using the HL7 FHIR standard. The platform provides two front ends; a patient facing smartphone app and a healthcare professional facing dashboard that is used inside three different hospitals in Italy, Estonia and the Netherlands. The overall architecture and implementation into practice is shown in this paper.

The state of the art of eHealth self-management interventions for people with Chronic Obstructive Pulmonary Disease: Scoping review

In 2025, Eline te Braake, Roswita Vaseur, Christiane Grünloh and Monique Tabak published a paper titled "The State of the Art of eHealth Self-Management Interventions for People with Chronic Obstructive Pulmonary Disease: Scoping Review" in the Journal of Medication

We identified articles published between January 1, 2012, and June 1, 2022, that described eHealth self-management interventions for COPD. Identified articles were screened for eligibility using the web-based software Rayyan.ai. Eligible articles were identified, assessed, and

Internet Research.
Link to publication

The abstract can be read below:

Background

Chronic obstructive pulmonary disease (COPD) is a common chronic incurable disease. Treatment of COPD often focuses on symptom management and progression prevention using pharmacological and nonpharmacological therapies (eg, medication, inhaler use, and smoking cessation). Self-management is an important aspect of managing COPD. Self-management interventions are increasingly delivered through eHealth, which may help people with COPD engage in self-management. However, little is known about the actual content of these eHealth interventions.

Objective

This literature review aimed to investigate the state-of-the-art eHealth self-management technologies for COPD. More specifically, we aimed to investigate the functionality, modality, technology readiness level, underlying theories of the technology, the positive health dimensions addressed, the target population characteristics (ie, the intended population, the included population, and the actual population), the self-management processes, and behavior change techniques.

Methods

A scoping review was performed to answer the proposed research questions. categorized by the reviewers, either directly or through a combination of methods, using Atlas.ti version 9.1.7.0. Thereafter, data were charted accordingly and presented with the purpose of giving an overview of currently available literature while highlighting existing gaps.

Results

A total of 101 eligible articles were included. This review found that most eHealth technologies (91/101, 90.1%) enable patients to self-monitor their symptoms using (smart) measuring devices (39/91, 43%), smartphones (27/91, 30%), or tablets (25/91, 27%). The self-management process of “taking ownership of health needs” (94/101, 93.1%), the behavior change technique of “feedback and monitoring” (88/101, 87%), and the positive health dimension of “bodily functioning” (101/101, 100%) were most often addressed. The inclusion criteria of studies and the actual populations reached show that a subset of people with COPD participate in eHealth studies.

Conclusions

The current body of literature related to eHealth interventions has a strong tendency toward managing the physical aspect of COPD self-management. The necessity to specify inclusion criteria to control variables, combined with the practical challenges of recruiting diverse participants, leads to people with COPD being included in eHealth studies that only represent a subgroup of the whole population. Therefore, future research should be aware of this unintentional blind spot, make efforts to reach the

The databases PubMed, Scopus, PsycINFO (via EBSCO), and Wiley were searched for relevant articles.

underrepresented population, and address multiple dimensions of the positive health paradigm.

Information corner

On COPD at the European level: EFA policy recommentations

On 5 February 2025, the European Federation of Allergy and Airways Diseases Patients' Associations (EFA) held an event at the European Parliament in Brussels on "Raising the Standards of Care for COPD in Europe".

Building on the 2024 report "Raising the Bar for Better Standards of Care for Chronic Obstructive Pulmonary Disease," this event explored progress and challenges in COPD care and prevention. Experts discussed how to elevate COPD on health agendas, addressing it as both a critical healthcare priority and a sustainability issue. The full policy recommendations are available here.

HOPE attended this event at the European Parliament and intervened to present RE-SAMPLE as a best practice.

WHO lung resolution

On 25 May 2025, Member States approved a landmark resolution on lung health, recognizing the urgent need to tackle respiratory diseases and their major risk factors, including air pollution and tobacco use. The Resolution aims to strengthen national and global actions to prevent, diagnose, and manage common lung conditions such as asthma, chronic obstructive pulmonary disease (COPD), lung cancer, pneumonia and tuberculosis.

The Resolution calls for improved access to affordable care, greater investment in clean air policies, and integrated strategies linking lung health with broader efforts on noncommunicable diseases (NCDs) and climate resilience. This milestone reaffirms global commitment to protecting respiratory health and preventing millions of avoidable premature deaths each year.

Events to come

ERS 2025

The ERS International Congress 2025 will be held from 27 September to 1 October 2025 in Amsterdam, Netherlands. The RE-SAMPLE team will hold a session at the ERS.

ERS EUROPEAN RESPIRATORY SOCIETY
every breath counts

Closing webinar

In November 2025, the RE-SAMPLE project will hold its closing webinar on the EU Health Policy Platform to present its key results and main achievements.

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